

Borehole

50-03-04

Log Event A

Borehole Information

Farm : <u>T</u>	Tank : <u>T-103</u>	Site Number : <u>299-W10-118</u>
N-Coord : <u>43,630</u>	W-Coord : <u>75,796</u>	TOC Elevation : <u>671.53</u>
Water Level, ft : <u>120.4</u>	Date Drilled : <u>7/31/1973</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness, in. : <u>0.237</u>	ID, in. : <u>4</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>123</u>	
Type : <u>Steel-welded</u>	Thickness, in. : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>123</u>	

Cement Bottom, ft. : 123 Cement Top, ft. : 0

Borehole Notes:

Borehole 50-03-04 was drilled in July 1973 to a depth of 87 ft with 6-in. casing. In April 1981, the borehole was deepened to 123 ft and the 6-in. casing was extended to the bottom of the borehole. The 6-in. casing was perforated from 0 to 20 ft and 80 to 123 ft. A 4-in. casing liner with a metal cap welded on the bottom was positioned inside the 6-in. casing. The entire annulus between the 4-in. and 6-in. casings was stemmed with 209 gal of grout. The thicknesses of the 4-in. and 6-in. casings are presumed to be 0.237 in. and 0.280 in., respectively, on the basis of the published thickness for schedule-40, 4-in. and 6-in. steel tubing.

Equipment Information

Logging System : <u>1B</u>	Detector Type : <u>HPGe</u>	Detector Efficiency : <u>35.0 %</u>
Calibration Date : <u>10/1997</u>	Calibration Reference : <u>GJO-HAN-20</u>	Logging Procedure : <u>MAC-VZCP 1.7.10-1</u>

Logging Information

Log Run Number : <u>1</u>	Log Run Date : <u>04/07/1998</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>200</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>29.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>04/08/1998</u>	Logging Engineer: <u>Alan Pearson</u>
Start Depth, ft.: <u>28.0</u>	Counting Time, sec.: <u>200</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>96.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Borehole

50-03-04**Log Event A**

Log Run Number :	<u>3</u>	Log Run Date :	<u>04/09/1998</u>	Logging Engineer:	<u>Alan Pearson</u>
Start Depth, ft.:	<u>121.0</u>	Counting Time, sec.:	<u>200</u>	L/R : <u>L</u>	Shield : <u>N</u>
Finish Depth, ft. :	<u>95.0</u>	MSA Interval, ft. :	<u>0.5</u>	Log Speed, ft/min.:	<u>n/a</u>

Logging Operation Notes:

This borehole was logged by the SGLS in three log runs using a 200-s counting time. The top of the borehole casing, which is the zero reference for the SGLS, is approximately flush with the ground surface. The total logging depth achieved was 121.0 ft.

Analysis Information

Analyst : E. LarsenData Processing Reference : MAC-VZCP 1.7.9Analysis Date : 11/02/1998**Analysis Notes :**

The pre-survey and post-survey field verification for each logging run met the acceptance criteria established for peak shape and system efficiency. The energy calibration and peak-shape calibration from the accepted calibration spectrum that most closely matched the field data were used to establish the peak resolution and channel-to-energy parameters used in processing the spectra acquired during the logging operation.

This borehole was completed with 4-in.- and 6-in.-diameter casings along the entire logged interval. A casing correction factor for a 0.50-in.-thick steel casing was applied to the concentration data because it most closely matched the 0.517-in. total combined thickness of the 4-in. and 6-in. casings. The entire annulus between the 4-in. and 6-in. casings is likely filled with grout, making it impossible to produce accurate radionuclide assays. However, man-made and natural radionuclides were identified and apparent concentrations are reported.

Approximately 1 ft of water has collected inside the bottom of this borehole. The appropriate water correction factor was not available, so no compensation was applied, resulting in lower reported man-made and natural radionuclide concentration values along the water-filled interval.

Log Plot Notes:

Separate log plots show the man-made and the naturally occurring radionuclides. The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

A time-sequence plot of the historical gross gamma log data from 1975 to 1994 is presented with the SGLS log plots.



Borehole

50-03-04

Log Event A

Results/Interpretations:

The radionuclide concentrations identified in this section are reported as apparent concentrations only and are underestimated.

The man-made radionuclides Cs-137, Co-60, Eu-154, Eu-152, Nb-94, Sn-126, U-238, and Sb-125 were detected by the SGLS. The Cs-137 contamination was detected nearly continuously from 1 to 7 ft and continuously from 20 to 24.5 ft. Isolated occurrences of Cs-137 contamination were detected at 16.5 and 37 ft and from 39 to 39.5 ft.

The Co-60 contamination was measured continuously from 21.5 to 49 ft and semi-continuously from 53.5 to 91.5 ft.

The Eu-154 contamination was measured continuously from 21 to 49 ft. Numerous intermittent occurrences of Eu-154 were detected between 54 and 96 ft.

The Eu-152 contamination was measured continuously from 22.5 to 42.5 ft. An isolated occurrence of Eu-152 was detected at 44.5 ft.

Small zones of continuous and nearly continuous Nb-94 contamination were detected between 25 and 39.5 ft.

Two small zones of continuous Sn-126 contamination were measured between 23 and 28.5 ft. An isolated occurrence of Sn-126 was detected at 39.5 ft.

Single occurrences of Sb-125 and U-238 contamination were detected at 39 and 43 ft, respectively.

The K-40 concentration values increase at 38 ft and remain elevated to about 43 ft. Slight increases in the U-238 and Th-232 concentrations occur at 39.5 and 41.5 ft, respectively. Increased KUT concentration values occur between 81 and 90 ft. Sharply decreased K-40 and Th-232 concentrations occur from 90 to 95 ft and 99.5 to 104 ft. A sharp peak in the U-238 concentrations was detected at 102 ft. The K-40 and Th-232 concentration values increase from about 105 to 109 ft and generally remain elevated to the bottom of the logged interval.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank T-103.